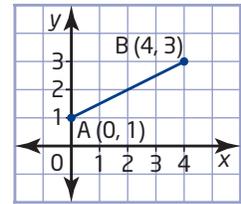


## Opportunity to learn

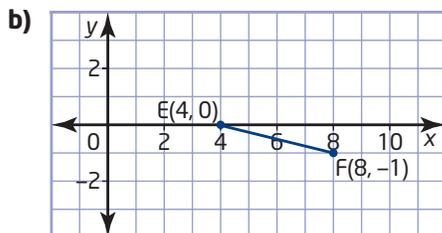
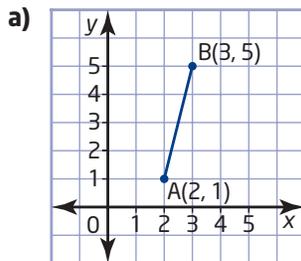
Complete all visible questions. Check your work using the final answers that are listed beginning on page 3 of this file.

- C2** When you use the formula for the length of a line segment, does it matter which point is represented by  $(x_1, y_1)$  and which point is represented by  $(x_2, y_2)$ ? Use an example to explain your reasoning.



NOTE: Question “C2”, above, will not have an answer listed. For question “C2”, answers may vary. We will discuss in our next class together.

1. Estimate the length of each line segment from its graph. Then, calculate the exact length.



2. Calculate the length of the line segment defined by each pair of endpoints.

c)  $E(-5, -6)$  and  $F(-1, -2)$

## Connect and Apply

4. On a city map, the coordinates of two department stores are  $(4, 3)$  and  $(1, 7)$ . How far apart are the stores if each unit on the map represents 1 km?

6. The vertices of  $\triangle ABC$  are  $A(2, 5)$ ,  $B(-6, -1)$ , and  $C(10, -1)$ .
- Determine the length of each side of this triangle.
  - Determine the perimeter of the triangle.
  - Classify the triangle.

8. Determine the length of the median from vertex J in the triangle with vertices  $J(-2, -2)$ ,  $K(-3, 2)$ , and  $L(1, 3)$ .

Consider using Desmos to check your answer to question 8 above or to help you visualize where the median from vertex J would be.

14. An architect's drawing shows a pipe running diagonally under a basement floor from a floor drain to a sewer connection. The floor drain is at a point 2 m east and 2 m north of the southwest corner of the basement. The sewer connection is 10 m east and 17 m north of the corner. The pipe costs \$3.15 per metre, including taxes. How much should the builder budget for pipe for the floor drain?

**HINT:** Make a diagram on graph paper. Make the origin of a Cartesian plane be the southwest corner of the basement. Label the "floor drain" as point F and think carefully about where it is located, relative to the southwest corner. Label the "sewer connection" as point S, and think carefully about where it is located. How does this help you solve the question?

17. The charges for most long-distance telephone calls used to be based on the distance between the two stations and the duration of the call. To determine the distance, telephone companies used a rectangular coordinate grid with its origin located off the northeast coast of Canada. The coordinates in this system indicate the horizontal and vertical distance from the grid's origin. This table lists the telephone coordinates, converted to kilometres, for four cities.

City	Coordinates
Edmonton	(3978, 2520)
Montréal	(1015, 2104)
Ottawa	(1142, 2232)
Toronto	(1268, 2540)



- Calculate the distance, to the nearest kilometre, between Edmonton and Ottawa, between Montréal and Toronto, and between Edmonton and Toronto.
- Research the flying distances between these cities. How accurate is the telephone coordinate system?

**HINT:** For part b) above, try using Apple Maps or Google Maps.

Check your work with the final answers beginning at the bottom right of this page.

You will need to match the number of the question (from pages above) to the number of the answer. For example, 1a) below is the final answer for question 1a) on the first page of this file.

## 2.2 Length of a Line Segment

1. Estimates may vary. Calculated lengths:

a)  $\sqrt{17}$       b)  $\sqrt{17}$       c)  $\sqrt{68}$

2. a)  $\sqrt{125}$       b)  $\sqrt{90}$       c)  $\sqrt{32}$       d) 10

4. 5 km

6. a)  $AB = AC = 10$ ,  $BC = 16$

b) 36

c) isosceles

8.  $\sqrt{\frac{85}{4}}$

14. \$53.55

17. a) Edmonton–Ottawa 2851 km;  
Montréal–Toronto 504 km;  
Edmonton–Toronto 2710 km
- b) Answers may vary. For example: The flying distances are about 2840 km for Edmonton–Ottawa, 505 km for Montréal–Toronto, and 2705 km for Edmonton–Toronto. The telephone coordinate system gives distances that are close to the flying distances.